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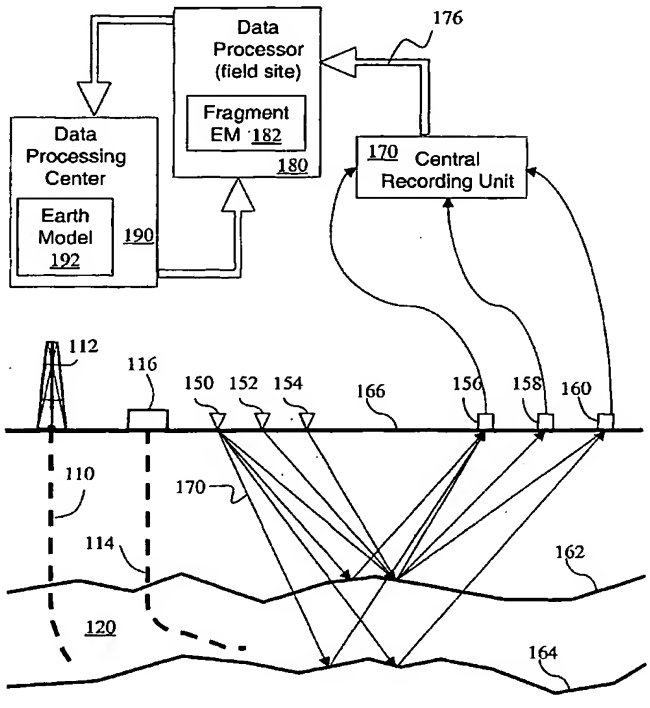
(54) Title: SYSTEM AND METHOD FOR REPRESENTING AND PROCESSING AND MODELING SUBTERRANEAN SURFACES



(57) Abstract: Methods and systems are disclosed for processing data used for hydrocarbon extraction from the earth. Symmetry transformation groups are identified from sampled earth structure data. A set of critical points is identified from the sampled data. Using the symmetry groups and the critical points, a plurality of subdivisions of shapes is generated, which together represent the original earth structures. The symmetry groups correspond to a plurality of shape families, each of which includes a set of predicted critical points. The subdivisions are preferably generated such that a shape family is selected according to a best fit between the critical points from the sampled data and the predicted critical points of the selected shape family.

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